Surgical Forum XLI

Chapter I—Nutrition

The Modulation of Hepatic Gene Expression by Dopamine and Dobutamine: The Effect on Fatty Acid Oxidation 1
Roderick A. Barke, MD, Paul S. Brady, PhD, and Linda J. Brady, PhD

Long-Term Cryopreserved Human Hepatocytes Maintain Drug Metabolizing Ability 3
Albert D. Moscioni, PhD, Gisela Backfisch, PhD, Terri Bellew, MS, David L. Black, PhD, and Achilles A. Demetriou, MD, PhD, FACS

Nutrient Substrate Potentiation of Interleukin-2 (IL-2) Immunotherapy 5
Michael D. Lieberman, MD, Robert K. Sigal, MD, Gerald Birch, BS, Jian Shou, MD, and John M. Daly, MD, FACS

Metabolic Effect of Cachectin/TNF Is Site Specific: Intramuscular Production Induces All Cachectic Changes, While Intracerebral Production Induces Primarily Anorexia 7
Brett Koplin, Thomas J. Fahey III, MD, Anthony Cerami, PhD, and Kevin J. Tracey, MD

Glutamine-Supplemented TPN Preserves Hepatic Glutathione and Improves Survival Following Chemotherapy 9
Roy W. Hong, MD, William S. Helton, MD, Jan D. Rounds, BS, and Douglas W. Wilmore, MD, FACS

Tumor Glutamine Use Exceeds Intestinal Glutamine Use in Cachectic Tumor-Bearing Rats 12
Mike K. Chen, MD, Thomas R. Austgen, MD, V. Suzanne Klimberg, MD, Edward M. Copeland III, MD, and Wiley W. Souba, MD, ScD

TPN vs. Oral Feeding: Bacterial Translocation, Cytokine Response, and Mortality After Escherichia Coli LPS Administration 14
Craig S. Rock, MD, Annabel E. Barber, MD, Eng-Hen Ng, MD, FRCS, William G. Jones, MD, Marc S. Roth, RPh, MS, Lyle L. Moldawer, PhD, and Stephen F. Lowry, MD, FACS

Characterization of Glutamine-Regulated Pancreatic Islet Hormone Release 16
Emanuel C. Opara, PhD, Warner M. Burch, MD, and Onye E. Akwari, MD, FRCSC, FACS

The Effect of Growth Hormone on Nutritional Markers in Enterally Fed, Immobilized Trauma Patients..... 20
Stephen W. Behrman, MD, Stacey Wojtysiak, PharmD, Rex O. Brown, PharmD, Kathryn L. Vehe, PharmD, Timothy C. Fabian, MD, FACS, and Kenneth A. Kudsk, MD, FACS

Effect of Advanced Age on Glucose Tolerance Following Injury 22
James M. Blakslee, MD, Sonya Moulton, MSc, and James M. Watters, MD, FRCSC, FACS

Glucocorticoid Receptor Blocker RU 38486 Decreased Muscle Protein Breakdown in Sepsis 26
Marianne Hall-Angerås, MD, Per-Olof Hasselgren, MD, PhD, Ulf Angerås, MD, PhD, Oded Zamir, MD, and Josef E. Fischer, MD, FACS

The Role of Central (CNS) Glucopenia in Modulating the Proteolytic Response of Acute Stress..... 28
Hisham Hourani, MD, D. Brooks Lacy, BS, John A. Morris, MD, FACS, and Naji N. Abumrad, MD, FACS

Chapter II—Critical Care

Dose-Response Characteristics of Hypertonic Saline Dextran Solutions 30
Lee Halvorsen, MD, Robert A. Gunther, PhD, and James W. Holcroft, MD, FACS

Hemodynamic Responses to Dopamine in Hypothermic Subjects 34
Chris M. Oung, MD, M. Salim Ratnani, MD, Michael English, MD, Ray C.-J. Chiu, MD, PhD, FACS, and E. John Hinchey, MD, FACS

Intrinsic Myocardial Function and Myocardial Response to an Opiate Agonist in Rats After Cecal Ligation and Puncture..... 37
Carmelo A. Milano, BS, Eduardo Mendez, BS, and Thomas Vargish, MD, FACS

Tumor Necrosis Factor Alpha Causes Diastolic Creep and Reversible Left Ventricular Systolic Dysfunction in Conscious Dogs 40
Francis D. Pagani, MD, PhD, Lauren S. Baker, PhD, Mark A. Knox, BS, Hsi Cheng, MD, Mitchell P. Fink, MD, FACS, and Marc S. Visner, MD, FACS

Altered Cell Membrane Function in Critical Illness Can Be Characterized by Measuring Body Reactance..... 43
Marc R. Scheltinga, MD, Thomas D. Kimbrough, MD, Danny O. Jacobs, MD, and Douglas W. Wilmore, MD, FACS

Metabolic Acidosis Associated With Hypertonic Saline Resuscitation in a Head-Injured Hemorrhagic Shock Model 45
Kimberly K. Nagy, MD, William P. Gunnar, MD, James M. Soyka, MD, James M. Kane, MD, John R. Andrews, MD, Marcel Martin, MD, and John Barrett, MD, FACS

Thromboxane Synthetase Inhibition Prevents the Increased Mesenteric Vascular Resistance Seen After Major Burn in a Chronic Porcine Model 47
Rifat Tokyay, MD, Daniel L. Traber, PhD, and David N. Herndon, MD, FACS

Changes in Hepatic Metabolism and Microcirculation in Response to Remote Inflammation: A Prologue to Liver Failure? 49
George T. Drugas, MD, Mindy M. Chin, BA, James E. Biewer, BS, and Mark G. Clemens, PhD

Localized Acid Aspiration Induces Multisystem Organ Injury via Activated Neutrophils 51
Gideon Goldman, MD, Richard Welbourn, MB, FRCS, Lester Kobzik, MD, C. Robert Valeri, MD, David Shepro, PhD, and Herbert B. Hechtman, MD, FACS

Alteration in Macrophage Function After Surgical Trauma 54
H. Paul Redmond, FRCSI, Pablo Leon, MD, Kurt P. Hofmann, MD, Jill Goldfine, MS, Jian Shou, MD, and John M. Daly, MD, FACS

Fluid Resuscitation of Focal Brain Injury and Shock 56
Jon Walsh, MD, Jing Zhuang, MD, and Steven R. Shackford, MD, FACS

Comparison of Resuscitation Fluids on Lipid Peroxidation in the Liver and Kidney After Hemorrhagic Shock 59
Tejinder P. Singh, MD, John A. Savino, MD, FACS, Nanakram Agarwal, MD, FACS, Tom Cerabona, MD, and Rahwi Omar, MD, PhD

Chapter III—Infection

CD18 Adhesion Receptors Promote Neutrophil Migration Across the Alveolar-Capillary Membrane in Sepsis-Induced Acute Lung Injury 62
Ciaran J. Walsh, MB, BSc, FRCSI, Daniel E. Bechard, MD, P. Declan Carey, MB, FRCSI, Daniel J. Cook, PhD, Alpha A. Fowler, MD, and Harvey J. Sugerman, MD, FACS

Induction of Nitric Oxide Production by Liver Cells In Vivo 64
Timothy R. Billiar, MD, Ronald D. Curran, MD, Josef Stadler, MD, Paul H. Kispert, MD, Roy Kim, Brian Harbrecht, MD, Juan Ochoa, MD, Debra Williams, and Richard L. Simmons, MD, FACS

Blood Clearance and Organ Localization of Candida Albicans 66
Schmuel Katz, MD, Glenn J. Merkel, PhD, Walter J. Folkening, BSc, Raoul S. Rosenthal, PhD, and Jay L. Grosfeld, MD, FACS

Increased Intestinal Protein Synthesis During Sepsis 68
Daniel von Allmen, MD, Per-Olof Hasselgren, MD, PhD, Takashi Higashiguchi, MD, Oded Zamir, MD, and Josef E. Fischer, MD, FACS

The Effect of Neurotensin and Epidermal Growth Factor on TPN-Induced IGA Deficiency..... 70
David Burke, MD, John Alverdy, MD, Eric Aoys, BS, Allen Agarwal, MD, and Gerald Moss, MD

Antiendotoxin Therapy Improves Survival in a Model of Thermal Injury and Sepsis..... 72
Brid M. Crowley, FRCSI, Michael G. O'Riordain, FRCSI, Kevin Ellwanger, BS, Kathryn H. Collins, BS, Inna B. Saporoschetz, BS, Michael A. Pilz, BA, John A. Mannick, MD, FACS, and Mary L. Rodrick, PhD

Impact of Hypercortisolemia on the Metabolic and Hormonal Responses to Endotoxin in Humans 74
Annabel E. Barber, MD, Susette M. Coyle, RN, Yuman Fong, MD, Eva Fischer, MD, Michael A. Marano, MD, Steve E. Calvano, PhD, Lyle L. Moldawer, PhD, G. Tom Shires, MD, FACS, and Stephen F. Lowry, MD, FACS

Commercially Available Surgical Gowns Do Not Prevent Penetration by HIV-1..... 77
Phillip P. Shadduck, MD, Douglas S. Tyler, MD, H. Kim Lyerly, MD, Mark W. Sebastian, MD, Christopher Farnitano, BA, Kevin T. Fitzpatrick, PA-C, Alphonse J. Langlois, PhD, and Joseph A. Moylan, MD

Kupffer Cells Provide the Signal for Hepatocyte Acute-Phase Protein Synthesis In Vitro 80
Paul H. Kispert, MD, Ronald D. Curran, MD, Timothy R. Billiar, MD, and Richard L. Simmons, MD

The Protective Capacity of Anti-Escherichia Coli J5 Murine Monoclonal Antibodies Is Dependent on Binding to Specific Epitopes Within the Lipopolysaccharide Molecule 83
Jaime L. Mayoral, MD, Mariaestela Ortiz, BS, Haemwantie A. Singh, BA, and David L. Dunn, MD, PhD

Increased Spontaneous B Cell Activity in Surgical Patients 86
Remi P. Schneider, MD, Nicolas V. Christou, MD, PhD, FRCSC, and Carl Nohr, MD, PhD, FRCSC

Identification and Regulation of Macrophage Procoagulant Activity in a Murine Model of Viral Hepatitis 88
Stephen Chung, MD, FRCSC, Bernard Langer, MD, FRCSC, FACS, and Gary Levy, MD, FRCPC

Chapter IV—Cytokines

Passive Immunization Against Cachectin (TNF-α) Prevents Hemorrhage-Induced Suppression of Kupffer Cell Functions 91
Wolfgang Ertel, MD, Mary H. Morrison, MS, Alfred Ayala, PhD, Michelle M. Perrin, and Irshad H. Chaudry, PhD

Tumor Necrosis Factor Promotes Bacterial Translocation in Tumor-Bearing Mice 94
William G. Jones II, MD, Annabel E. Barber, MD, Yannick P. Leconte, MD, Thomas J. Fahey III, MD, Brett Koplin, BS, Anthony Cerami, PhD, Kevin J. Tracey, MD, and G. Tom Shires, MD, FACS

Intravenous Interleukin-8 Reduces Neutrophil Accumulation at Intradermal Sites of Inflammation 96
Daniel H. Hechtman, MD, Myron I. Cybulsky, MD, Joffre B. Baker, PhD, and Michael A. Gimbrone, Jr., MD

Increased Polymorphonuclear Neutrophil Delivery to Inflammatory Lesions in Anergic Patients Is Mediated via Interleukin-1 and Interleukin-6 99
Jose M. Tellado, MD, and Nicolas V. Christou, MD, PhD, FRCSC, FACS

Reactive Oxygen Species Can Amplify Macrophage Tumor Necrosis Factor Production 101
Helen W. Pogrebniak, MD, Wilbert A. Matthews, BS, and Harvey I. Pass, MD, FACS

Human Recombinant Tumor Necrosis Factor (hrTNF) Protection Against Endotoxin-Induced Shock and Lethality in the Rat 103
H. Richard Alexander, MD, Howard N. Langstein, MD, Gerard M. Doherty, MD, J. Christian Jensen, MD, and Jeffrey A. Norton, MD, FACS

Macrophage Inflammatory Protein-1 Induces Cytokine Production In Vitro and In Vivo 105
Thomas J. Fahey III, MD, Barbara Sherry, PhD, Kevin J. Tracey, MD, William G. Jones II, MD, Anthony Cerami, PhD, and G. Tom Shires, MD, FACS

Postinjury Cytokine Response: A Selective Depression in G-CSF in the Face of Elevated Interleukin-6..... 107
Frederick A. Moore, MD, Renato S. Poggetti, MD, Ernest E. Moore, MD, FACS, Marie Renick, BS, Larry Bennett, PhD, Polly Parsons, MD, and Verlyn M. Peterson, MD

Hepatocyte-Derived GM-CSF Is a Priming and Proliferative Signal for Kupffer Cells..... 110
Paul E. Bankey, MD, Mariaestela Ortiz, BS, Ann Carlson, BA, and Frank B. Cerra, MD, FACS

Polymorphonuclear Neutrophils: Potential Role in Cytokine Response to Injury and Infection 112
Dominik B. Dubravec, DDS, MMSc, Inna B. Saporoschetz, BS, Kathryn H. Collins, BS, John A. Mannick, MD, FACS, and Mary L. Rodrick, PhD

Monoclonal Antibody Against Murine Interleukin-6 Prevents Lethal Effects of Escherichia Coli Sepsis and Tumor Necrosis Factor Challenge in Mice..... 114
John H. Yim, BS, Anand Tewari, MD, Michael K. Pearce, BS, Jian-Chao Zou, MD, John S. Abrams, PhD, and H. Fletcher Starnes, Jr., MD

Sepsis Selectively Activates Peritoneal but Not Alveolar Macrophage to Release Inflammatory Mediators (Il-1, IL-6, and TNF) 117
Alfred Ayala, PhD, Michelle M. Perrin, John M. Kisala, MD, Wolfgang Ertel, MD, and Irshad H. Chaudry, PhD

Chapter V—Gastrointestinal Tract, Pancreas, and Biliary Tract

Sensory Denervation Alters Gastric Acid Secretory and Blood Flow Response to Pantagastrin 120
Edward H. Livingston, MD, Peter Holzer, PhD, Edward P. Passaro, MD, FACS, and Paul H. Guth, MD, FACP

Modulation of Esophageal Blood Flow: A Local Effector Function of Sensory Nerves 122
Karim S. Trad, MD, Marie T. Fernicola, MD, Fawaz Z. Hakki, MD, Adam J. Dziki, MD, PhD, John W. Harmon, MD, FACS, and Barbara L. Bass, MD, FACS

Radionuclide Gastric Emptying, Gastric Myoelectric Activity, and the Effect of Electrical Pacing After Gastric Surgery 125
Michael P. Hocking, MD, FACS, Robert G. Carlson, MD, W. Douglas Harrison, MD, Charles A. Sninsky, MD, and Stephen B. Vogel, MD, FACS

Role of Granulocytes in FMLP-Induced Changes in Gastric Vascular Resistance in the Dog 127
Genon M. Wicina, BS, John G. Wood, PhD, and Laurence Y. Cheung, MD, FACS

Effects of Calcium Ion (CA^{++}) on Pathways of Ion Transport in Gastric Surface Epithelium 129
David Soybel, MD, Stanley Ashley, MD, and Laurence Y. Cheung, MD, FACS

Postoperative Delay in Gastric Emptying Is Prevented by Intracisternal Injection of CRF Antagonist in the Rat 132
Erik Barquist, MD, J. Rivier, PhD, Michael J. Zinner, MD, and Yvette Taché, PhD

Opiate Inhibition of Neural Conduction in the Canine Distal Esophagus 134
Anthony D. Sandler, MD, Cornell Peters, MD, MSN, Jerry F. Schlegel, BS, and James W. Maher, MD, FACS

Intracerebroventricular Galanin Augments Basal and Meal-Stimulated Gastric Acid Secretion 136
Justin G. Geoghegan, MB, FRCSI, D. Curtis Lawson, BS, and Theodore N. Pappas, MD

Topical Leukotriene (LTC_4) Exacerbates Bile Acid Injury to the Superficial Gastric Mucosa in Rats 138
David W. Mercer, MD, Richard E. Milner, BS, Merick J. Kirshner, MD, Wallace P. Ritchie, Jr., MD, PhD, FACS, and Daniel T. Dempsey, MD, FACS

Role of α_2 Adrenoreceptors in the Prevention of Gastric Injury by Ethanol 140
Michael S. Tornwall, MD, Julia M. Henagan, MS, and Thomas A. Miller, MD, FACS

Circadian Rhythm of Bicarbonate (HCO_3^-) Secretion in Rat Stomach 142
Merril T. Dayton, MD, FACS, Ken Larsen, PhD, David Pigott, Robert Nohavec, and John G. Moore, MD

The Effect of Endogenous Brain Gamma-Aminobutyric Acid (GABA) Levels on Gastric Acid Secretion 145
Brian D. Gill, MD, and Richard C. Thirlby, MD, FACS

Increased Biliary Unconjugated Bilirubin During Total Parenteral Nutrition 147
Lillian G. Dawes, MD, MaryAnne Greiner, Robert V. Rege, MD, FACS, and David L. Nahrwold, MD, FACS

Traumatic Pancreatitis: An Experimental Model Using Graded Direct Organ Contusion 149
Adolfo A. Trocino, MD, Eutiquio Teh, BSChe, J.J. Steinberg, MD, Stanley M. Levenson, MD, FACS, and Harry M. Delaney, MD, FACS

Cholesterol Feeding and Gender Alter Rabbit Bile Phospholipids 153
Stuart I. Myers, MD, Lori Bartula, BS, and Wojtek Nabzdyk

Octreotide Inhibits Protein-Stimulated Sphincter of Oddi Motility 155
Steven A. Ahrendt, MD, Keith D. Lillemoe, MD, FACS, and Henry A. Pitt, MD, FACS

Substance P Stimulates the In Vitro Sphincter of Oddi of the Opossum Through a Calcium-Dependent Pathway 157
Jose E. Parodi, MD, Michael J. Feldman, BS, Daniel K. Nelson, MS, and James M. Becker, MD, FACS

Prophylactic Sandostatin Potentiates Acute Pancreatitis 160
Peter Metrakos, MD, Lawrence Rosenberg, MD, PhD, FRCSC, William P. Duguid, MB, FRCPath, and Gerald M. Fried, MD, FRCSC, FACS

Acute Pancreatitis Caused by Pancreatic and Bile Duct Obstruction Impairs Pancreatic Enzyme but Not Bicarbonate Secretion 162
Kenric M. Murayama, MD, James B. Drew, MS, David L. Nahrwold, MD, FACS, and Raymond J. Joehl, MD, FACS

Measuring Hepatic Extraction Efficiency Noninvasively With a Single Intravenous Radiotracer Injection 164
Margaret K. Monahan, MD, Larry J. Goldstein, MD, Norah Milne, MbChb, Kenneth P. Lyons, MD, Scott D. Storms, BA, and Eric B. Rypins, MD, FACS

Secretory IgA Inhibits Adherence of Escherichia Coli to Gallbladder Mucosa....167
Melody O'Connor Allen, MD, FACS, David L. Cherwitz, MD, Richard G. Charboneau, and Eugene E. Freeman

Gallbladder Function in Pregnancy: A New Model....169
Leon G. Josephs, MD, John H. Arnold, MD, Fred Gorstein, MD, and Lester F. Williams, Jr., MD, FACS

Cholesterol-Saturated Hepatic Bile Increases Gallbladder Mucosal Blood Flow....171
Robert L. Conter, MD, John L. Washington, Chao-Chuan Liao, PhD, and Gordon L. Kauffman, Jr., MD, FACS

Does Acetaldehyde Play a Role in the Pathogenesis of Acute Pancreatitis?....173
Isto Nordback, MD, Simon MacGowan, FRCSI, and John L. Cameron, MD, FACS

Ileal Oleate Slows Gastric Emptying and Inhibits Intestinal Motility....175
Zeev Dreznik, MD, FACS, Debra Brocksmith, BS, Thomas Meininger, and Nathaniel J. Soper, MD

Postprandial Peptide YY Release Is Mediated by Cholecystokinin....177
David W. McFadden, MD, Marek Rudnicki, MD, Boris Kuvshinoff, MD, and Josef E. Fischer, MD, FACS

Proximal Gastric Distention Does Not Inhibit the Fasting Motility of the Autotransplanted Intestine: A Consequence of the Vagal Component of Denervation....179
Rory R. Dalton, MD, A. Marisia Walters, MB, ChB, FRCS, and Michael G. Sarr, MD

5-Hydroxytryptamine Is an Autocrine Growth Factor for Human Pancreatic Carcinoid.....182
Jin Ishizuka, MD, Robert D. Beauchamp, MD, Dilipkumar Parekh, MD, Courtney M. Townsend, Jr., MD, FACS, and James C. Thompson, MD, FACS

Peptide YY Inhibits Somatostatin-Suppressed Bile Flow 184
Shosaku Nakahara, MD, Camelia Taylor, BS, and Bruce Schirmer, MD, FACS

The Effect of Pancreatic Polypeptide on Glucose Disposal in Pancreas Transplantation 186
Henry Prillaman, BA, Steve Cox, MD, Gregory Cornett, BA, Terry Flanagan, MPH, Ron Chance, PhD, Arthur Freedlender, PhD, and John B. Hanks, MD, FACS

5-Hydroxytryptamine-Induced Rat Colonic Secretion: Evidence for an Enteric Mucosal 5-HT_2 Receptor 189
Ajith K. Siriwardena, MBChB, FRCSEd, FRCS, and John M. Kellum, Jr., MD, FACS

Peptide YY Inhibits VIP-Stimulated Ion Transport in the Distal Colon by Increasing Phosphodiesterase Activity.....191
J. Scott Flint, MD, Garth H. Ballantyne, MD, FACS, James R. Goldenring, MD, PhD, L. Peter Fielding, MD, FRCS, and Irvin M. Modlin, MD, PhD, FRCS, FACS

Use of Small Intestine Transplantation to Study the Mechanisms Involved in the Enterogastric Reflex in Rats 193
Susan L. Orloff, MD, Nigel W. Bunnett, PhD, and Haile T. Debas, MD, FACS

Intravenous Glutamine Stimulates Brush Border Glutamine Transport 195
Rabih M. Salloum, MD, Kenneth Herskowitz, MD, and Wiley W. Souba, MD, ScD

Selective Effects of Arterial Insulin on Islet Cell Secretion in the Isolated Perfused Human Pancreas 198
F. Charles Brunicardi, MD, Ronald Gingerich, PhD, and Dana K. Andersen, MD, FACS

Chapter VI—Cardiothoracic Surgery

Limiting Edema in Neonatal Cardiopulmonary Bypass 201
Thomas Yeh, Jr., MD, Jitendra M. Parmar, MB, ChB, FRCS, Ivan M. Rebeyka, MD, K. Francis Lee, MD, Gary K. Lofland, MD, and Andrew S. Wechsler, MD, FACS

Regional Myocardial Blood Flow During Cardiopulmonary Bypass in the Fetal Lamb 203
Scott M. Bradley, MD, Frank L. Hanley, MD, Brian W. Duncan, MD, Russell W. Jennings, MD, Judith A. Jester, MS, and Edward D. Verrier, MD

Immature Myocardium Effluxes Calcium During Reversible Ischemia 206
Ernesto Jimenez, MD, Pedro del Nido, MD, Harold Feinberg, PhD, and Sidney Levitsky, MD, FACS

Cerebral Metabolism in the Cyanotic Animal: The Effect of Hypothermic Cardiopulmonary Bypass and Circulatory Arrest 208
Patrick K. Griffith, MD, Michael Siegman, MD, Robert S. Balaban, PhD, Toni Ceckler, PhD, Richard E. Clark, MD, FACS, and Julie A. Swain, MD, FACS

Prolonged Preservation of Human Pediatric Hearts: Correlation of Ischemic Time and Subsequent Function 211
Motohiro Kawauchi, MD, Steven R. Gundry, MD, Javier Alonso de Begona, MD, David A. Fullerton, MD, Anees J. Razzouk, MD, Mark Boucek, MD, Mohammad Kanakriyeh, MD, and Leonard L. Bailey, MD, FACS

Myocyte Remodeling and Reduced Cellular Adhesion Accompanies Ventricular Failure With Supraventricular Tachycardia 213
James L. Zellner, MD, Francis G. Spinale, PhD, Diane K. Eble, BA, Kenneth Hewett, PhD, and Fred A. Crawford, Jr., MD, FACS

The Feasibility of Chemical Ablation of Accessory Pathways Responsible for the Wolff-Parkinson-White Syndrome 215
Michael Rosenbloom, MD, John C. Laschinger, MD, John P. Boineau, MD, Jeffrey E. Saffitz, MD, PhD, and James L. Cox, MD, FACS

"Closed-Heart" Treatment for Ventricular Tachycardia: Effects Achieved With Balloon Electric Shock Ablation Technique 217
Shunichi Mizuno, MD, Akihiko Usui, MD, Lynda Mickleborough, MD, FRCSC, Gregory Wilson, MD, Donna McComb, MSc, and Gordon Gray, BSc

An Experimental Model Based on Mustard's Atrial Flutter 219
Todd A. Shuman, MD, Robert S. Palazzo, MD, Richard B. Schuessler, PhD, Grace S. Wolff, MD, John P. Boineau, MD, and James C. Cox, MD, FACS

Myocardial Creep and Contractile Dysfunction After Ventricular Distention 221
Stephen W. Downing, MD, Edward B. Savage, MD, Krishanu B. Gupta, PhD, Daniel K. Bogen, MD, PhD, L. Henry Edmunds, MD, FACS, and George S. Tyson, MD

Doppler-Derived Gradients Across Prosthetic Aortic Valves Are Inaccurate 223
Edward P. Nast, MD, Sandy F.C. Stewart, PhD, Francisco A. Arabia, MD, Thomas L. Talbot, MS, and Richard E. Clark, MD, FACS

Myocardial Revascularization by Laser-Induced Channels.....225
Valluvan Jeevanandam, MD, Joseph S. Auteri, MD,
Mehmet C. Oz, MD, James Watkins, BS, Eric A. Rose, MD,
and Craig R. Smith, MD

Routine Measurement of Myocardial Temperature Is Not Reflective of
Myocardial Metabolism During Cardiac Surgery 228
Joseph A. Dearani, MD, Trevor C. Axford, MD,
Manisha A. Patel, BA, Nancy A. Healey, BS, and
Shukri F. Khuri, MD, FACS

Effect of Blood Cardioplegia Reperfusion on Recovery of Ventricular
Function Aftter Global Myocardial Ischemia 230
Theodore C. Koutlas, MD, John C. Lucke, MD,
Stanley A, Gall, Jr., MD, Thomas A. D'Amico, MD,
J. Scott Rankin, MD, FACS, and Donald D. Glower, MD

Continuous Warm Blood Cardioplegia 233
Anthony Panos, MD, MSc, FRCSC, Simon J. Kingsley, BSc,
Aaron P. Hong, BSc, Tomas A. Salerno, MD, MSc, FRCSC, FACS,
and Samuel V. Lichtenstein, BASc, MD, PhD, FRCSC

The Myocardial Protective Properties of Hypothermic Blood
Cardioplegia Are Critically Dependent on Oxygen 236
J. Steve Julian, MD, Hideo Yokoyama, MD,
Jakob Vinten-Johansen, PhD, William E. Johnston, MD,
Tonya D. Smith, BS, D. Scott McGee, BS,
and A. Robert Cordell, MD

Effects of Ischemic Ventricular Fibrillation on Myocardial Mechanics
and Energetics in the Porcine Heart 239
Irvin B. Krukenkamp, MD, Michael Badellino, MD, and
Sidney Levitsky, MD, FACS

Pyruvate Improves Postischemic Myocardial Function and ATP Recovery: A 31P NMR Spectroscopy Study 241
K. Eric Sommers, MD, Elena Simplaceanu, MS, Ralph D. Siewers, MD, Chien Ho, PhD, and Pedro J. del Nido, MD

Effect of Adenosine Deaminase Inhibition on Cardiac Interstitial Fluid Purine Metabolites During Myocardial Ischemia and Reperfusion....243
Tracy A. Dorheim, MD, David G.L. Van Wylen, PhD, and Robert M. Mentzer, Jr., MD, FACS

Myocardial Preservation by Cyclocreatine: Restoration of Postischemic Myocardial Contractility.....246
Medhat E. Allam, MD, Stuart Houser, MD, FACS, Fayyaz Hashmi, MD, FACS, Xuekun Liu, MD, Gerald A. Cordis, MS, and Salwa A. Elgebaly, PhD

Cardiac-Derived Thromboxane Mediates Reperfusion Injury in the Isolated Rat Heart 250
John G. Byrne, MD, Gregory S. Couper, MD, Shu-Ching Sun, MD, Rita G. Laurence, BS, and Lawrence H. Cohn, MD, FACS

Intraoperative Assessment of Retrograde Cardioplegia Distribution Using Myocardial Contrast Echocardiography.....252
Flordeliza Villanueva, MD, Sanjiv Kaul, MD, FACC, William Glasheen, ME, Anthony Broccoli, BA, and William Spotnitz, MD, FACC, FACS

Effects of Global Ischemia on the Metabolic to Mechanical Energy Transfer Characteristics of the Left Ventricle.....254
John C. Lucke, MD, Theodore C. Koutlas, MD, Stanley A. Gall, Jr., MD, Thomas A. D'Amico, MD, Donald D. Glower, MD, and J. Scott Rankin, MD, FACS

Transmural Intramyocardial Pressure Gradients Determine Regional Myocardial Perfusion During Ischemia and Reperfusion 258
Daniel L. Miller, MD, Young D. Kim, MD, Ali P. Analouei, PhD, Marc S. Visner, MD, FACS, and Robert B. Wallace, MD, FACS

Dynamic Cardiomyoplasty on Left Ventricular Systolic and Diastolic Functions in a Canine Model of Chronic Heart Failure.....260
Wang Cheng, MD, PhD, Mark S. Soberman, MD, Alexander G. Justicz, MD, and James D. Sink, MD, FACS

Effects of Dynamic Cardiomyoplasty on Left Ventricular Dynamic Geometry in a Canine Model of Dilated Cardiomyopathy.....263
K. Francis Lee, MD, Cornelius M. Dyke, MD, Rebecca J. Dignan, MD, Jitendra M. Parmar, MB, ChB, FRCS, Thomas Yeh, Jr., MD, Gary Benton, MD, and Andrew S. Wechsler, MD, FACS

Pulmonary Artery Balloon Counterpulsation: Hemodynamically Significant Effects After 12 Hours Without Detriment to Cardiac Function.....265
George V. Letsou, MD, Kenneth L. Franco, MD, Wayne Detmer, BA, Spyros Condos, MS, Sidney Wolvek, MA, and John C. Baldwin, MD, FACS

Use of Skeletal Muscle Power to Augment the Pulmonary Circulation.....267
Charles R. Bridges, Jr., MD, ScD, Edward Woodford, BA, Gerardo Mora, MD, David R. Anderson, MA, FRCS, Larry W. Stephenson, MD, and William I. Norwood, MD, PhD

Stroke Volume Characteristics of a New, Single-Port Right Ventricular Assist Device.....270
Eric S. Bour, MD, Craig B. Wisman, MD, William S. Pierce, MD, FACS, and John A. Waldhausen, MD, FACS

Computer-Aided 3D Solid Modeling of the Canine Biventricular Unit.....274
Lawrence A. Creswell, MD, John S. Pirolo, MD, Michael W. Vannier, MD, Donald G. Gayou, PhD, Barna A. Szabo, PhD, Kent W. Myers, MS, James L. Cox, MD, FACS, and Michael K. Pasque, MD

The Preservation of Cardiac Function After Brain Death: A Myocardial Pressure-Dimension Analysis 277
Thomas A. D'Amico, MD, Scott A. Buchanan, BA, John C. Lucke, MD, Theodore C. Koutlas, MD, Pablo F. Soto, BSE, Stanley A. Gall, MD, and Peter Van Trigt, MD

Long-Term Survival of Heterotopic Primate Xenografts Treated With Total Lymphoid Irradiation and Cyclosporine 279
Mitchell S. Roslin, MD, Robert F. Tranbaugh, MD, FACS, Matthew S. Coons, MD, Antonio Panza, MD, Bruce Toporoff, MD, Irene Alexandopoulous, PhD, Chun-Kuo Chen, MD, Tsong H. Chang, MD, Allen J. Norin, PhD, and Joseph N. Cunningham, MD, FACS

Positive Correlation of Functional Recovery and Tissue ATP Levels in the Hypothermically Stored Cardiac Explant 282
Cliff P. Connery, MD, George L. Hicks, MD, FACS, and Tingchung Wang, PhD

Cyclosporine A Alters Endothelial Arachidonate Metabolism in the Isolated Crystalloid-Perfused Rabbit Heart 284
Steven J. Fishman, MD, David S. Warsaw, BS, Carol A. Fisher, BA, Elliot S. Barnathan, MD, and V. Paul Addonizio, MD, FACS

Thromboxane A_2 Receptor-Specific Blockade Ameliorates Global Ischemic Injury and Prevents Heparin-Protamine Reaction After Hypothermic Cardiopulmonary Bypass 286
Eric N. Mendeloff, MD, Isabella Y.S. Liang, PhD, Julie A. Swain, MD, FACS, and Richard E. Clark, MD, FACS

Hirudin as an Alternative Anticoagulant to Heparin in Cardiopulmonary Bypass 289
Mamdouh Bakhos, MD, Jeanine M. Walenga, PhD, Harry L. Messmore, MD, Jawed Fareed, PhD, and Roque Pifarre, MD

Laboratory Comparison of Stump Closure Strength With Individual Ligation Versus Mass Hilar Stapling for Pneumonectomy.....291
Gregory D. Casey, MD, Farouck N. Obeid, MD, FACS, Victor J. Sorensen, MD, FACS, and Brack A. Bivins, MD, FACS

Airway Blood Flow After Light and Heavy Smoke Inhalation Injury.....293
Kenneth Ashley, BS, Joseph C. Stothert, Jr., MD, PhD, FACS, Daniel Traber, PhD, Lillian Traber, RN, George Kramer, PhD, and David Herndon, MD, FACS

Denervation Causes Small Airway Obstruction in Transplanted Porcine Lobes.....295
Charles Hobson, MD, W. Gerald Teague, MD, Curtis G. Tribble, MD, Barry Chan, MD, Jon Agee, MD, Terry Flanagan, MPH, and Irving L. Kron, MD, FACS

Prevention of Reflex-Mediated Increases in Cerebrospinal Fluid Pressure During Aortic Surgery.....297
Paul A. Spence, MD, FRCSC, Robert M. Lust, PhD, You Su Sun, MD, Quanmei Deng, MD, J. Mark Williams, MD, FACS, and W. Randolph Chitwood, Jr., MD, FACC, FACS

Spinal Cord Protection During Ischemia Secondary to Aortic Occlusion: Efficacy of Intrathecal Tetracaine 299
William L. Breckwoldt, MD, James T. Diehl, MD, FACS, Raymond J. Connolly, PhD, and Richard J. Cleveland, MD, FACS

The Effects of Hypothermic Anesthesia on Gut Fuel Metabolism 301
Kenneth Herskowitz, MD, Tomas D. Martin, MD, Thomas R. Austgen, MD, Edward M. Copeland III, MD, and Wiley W. Souba, MD, ScD

Greater Maximal Myocardial Oxygen Delivery After Hemodilution With Polymerized Bovine Hemoglobin Blood Substitute 304
George T. Hodakowski, MD, Richard D. Page, FRCS, Wolfgang Harringer, MD, Tracy Svizzero, BS, J. Luis Guerrero, BS, Edward E. Jacobs, Jr., MD, FACS, Paul J. LaRaia, MD, W. Gerald Austen, MD, FACS, and Gus J. Vlahakes, MD, FACS

Platelet Function and Hemostasis After Cardiopulmonary Bypass: A Comparison of Hypothermic and Normothermic Cardiopulmonary Bypass 307
W. Douglas Lazenby, MD, Wilson Ko, MD, Babette B. Weksler, MD, Mark Weiner, BS, John A. Zelano, PhD, Cathy Lynch, BS, O. Wayne Isom, MD, FACS, and Karl H. Krieger, MD, FACS

Endothelial Cell Injury During Global Cardiac Ischemia and Reperfusion 309
Molly K. McAfee, MD, Kazuhiro Hashimoto, MD, Paul J. Pearson, and Hartzell V. Schaff, MD

Hypoxia Releases a Vasoconstrictor Substance From the Endothelium of the Human Internal Mammary Artery 311
Pyng J. Lin, MD, Paul J. Pearson, MD, PhD, and Hartzell V. Schaff, MD

Prolonged, Lateralized Sternal Devascularization With Internal Mammary Artery Mobilization and Increased Experimental Infection Rate Following Bilateral Use 313
Robert M. Lust, PhD, You Su Sun, MD, and W. Randolph Chitwood, Jr., MD, FACC, FACS

Proposed Use of Cross-Linked Hemoglobin as a Blood Substitute 315
Anand Tewari, MD, Carl E. Mondon, PhD, Daniel Brown, MA, Antonious L. Van-Kessel, BSc, Jon C. Kosek, MD, and H. Fletcher Starnes, Jr., MD

Chapter VII—Vascular Surgery

Reduction of Intimal Hyperplasia in Experimental Vein Grafts by the Angiotensin-Converting Enzyme Inhibitor Captopril 318
Martin K. O'Donohoe, MB, BSc, FRCSI, Lewis B. Schwartz, MD, Zeljko S. Radic, MD, Eileen M. Mikat, PhD, Richard L. McCann, MD, and Per-Otto Hagen, PhD

Fish Oils Inhibit Human Vascular Smooth Muscle Cell Proliferation In Vitro 320
Richard P. Cambria, MD, and Nancy Chung-Welch, PhD

Thrombin Alters Permeability and Proliferation of Co-Cultured Endothelial and Smooth Muscle Cells 322
Debra J. Graham, MD, J. Jeffrey Alexander, MD, FACS, and Remedios Miguel, MS

Hypertension and the Formation of Abdominal Aortic Aneurysms 325
Michael J. Petersen, MD, Peter B. H'Doubler, Jr., MD, Bernice E. Hoppel, MS, Roslyn W. Orkin, PhD, Joseph Megerman, PhD, Bruce Rosen, MD, PhD, and William M. Abbott, MD, FACS

Elastase Secretion by Smooth Muscle Cells Grown in Culture From Human Abdominal Aortic Aneurysm Explants 328
Jon R. Cohen, MD, FACS, Isaac Sarfati, PhD, Debra Dana, and Leslie Wise, MD, FACS

Thrombomodulin Activity in Human Saphenous Veins Before and After Harvest for Coronary Artery Bypass Grafting 330
James M. Cook, MD, Christine D. Cook, BS, Richard Marlar, PhD, Mark B. Kahn, MD, Gary Barone, MD, Soo Young Chung, MD, Russell Wood, MD, James Harrell, MD, Louis M. Fink, MD, and John F. Eidt, MD

Contractile Response of Human Vascular Tissue to Endothelin 332
Ronald L. Dalman, MD, Christian T. Harker, PhD,
Lloyd M. Taylor, Jr., MD, and John M. Porter, MD

Autoradiographic Mapping of Insulin-Like Growth Factor-I Receptor Binding in the Atherosclerotic Arteries of the Rabbit.....334
Anton N. Sidawy, MD, FACS, Basel Termanini, MD,
John W. Harmon, MD, FACS, Ron V. Nardi, PhD,
and Louis Y. Korman, MD

Effect of Genetic Transduction on In Vitro Canine Endothelial Cell Prostanoid Production and Growth 337
Thomas E. Brothers, MD, Lisa M. Judge, MD,
James M. Wilson, MD, PhD, William E. Burkel, PhD, and
James C. Stanley, MD, FACS

Selective Induction of Intercellular Adhesion Molecule Expression by Human Endothelial Cells After Adherence to Vascular Grafts.....339
Michael S. Margiotta, MD, Fredika M. Robertson, PhD, and
Ralph S. Greco, MD, FACS

Platelet Adhesion to an Artificial Surface: The Roles of GPIb and GPIIb/IIIa 341
Richard A. Sheppeck, MD, Michael Bentz, MD,
Christopher Dickson, MD, Steven Hribar, BS, and
Peter C. Johnson, MD

The Role of Eicosanoids and Leukocytes in the Pathophysiology of Ischemia Reperfusion Injury in Skeletal Muscle.....344
Robert A. Cambria, MD, Robert J. Anderson, MD,
George Dikdan, MS, Thomas W. Lysz, PhD, and
Robert W. Hobson II, MD

The Effect of Cigarette Smoking on Endothelial Cell Production of Thromboxane A2 and Prostacyclin 346
Tracy A. Lowery, MD, Blair A. Keagy, MD, FACS,
David B. Dorofi, BS, and George Johnson, Jr., MD, FACS

Long-Term Patency of Cryopreserved and Fresh Canine Vein Allografts.....349
Nicholas V. Augelli, MD, Flavian M. Lupinetti, MD, Stephen J. Sanofsky, MD, Hazem El Khatib, MD, and Nicholas P. Rossi, MD, FACS

Prednisone Reduction of Atherosclerosis in Diet-Induced Hypercholesterolemic Rabbits: Does Immunomodulation Play a Role?.....351
Diane K. Stoller, MD, Christian T. Campos, MD, Craig B. Grorud, MD, Van Michalek, BA, and Henry Buchwald, MD, PhD, FACS

Coronary Artery Disease Versus Peripheral Vascular Disease: Two Distinct and Divergent Immunologic Profiles.....354
Michael J. Vitti, MD, Abdi T. Sherif, MD, Ali Safavi, MD, and William G. Ramey, MD, FACS

Deposition of Platelets and Fibrinogen on Ex Vivo Vascular Segments Dependence on Shear Rate 357
John Blebea, MD, Kenneth Ouriel, MD, Raymond A. Zollo, BS, and Victor J. Marder, MD

Mechanism of Superficial Femoral Artery Adductor Canal Stenosis 359
John M. Blair, Jr., MD, Seymour Glagov, MD, and Christopher K. Zarins, MD

The Biologic Response to Arterial Repair in Laser-Welded and Sutured Anastomoses 361
John V. White, MD, FACS, Eric Leefmans, MD, John Edwards, MD, Joseph Megerman, PhD, and William M. Abbott, MD, FACS

Selective Laser Photoablation Enhances Thrombolytic Graft Recanalization.....363
Glenn M. LaMuraglia, MD, FACS, Paolo Ortu, MD, David Fillmore, MD, Susan Obremski, MS, Christos Athanasoulis, MD, and William M. Abbott, MD, FACS

Successful Dacron Graft Replacement of Abdominal Aorta or the Inferior Vena Cava in Rats: Two Mechanisms of Healing.....365
Hai Zhang, MD, and G. Melville Williams, MD

Partially Bioresorbable Arterial Prostheses in the Dog.....368
Charles W. Tattersall, MD, John J. Klosak, MD, Emma B.A. Cabusao, MD, Dae Un Kim, MD, and Howard P. Greisler, MD, FACS

CHAPTER VIII—Transplantation and its Related Immunology

Differences Between Mouse Strains in Xenograft Survival After Immunosuppression In Vivo Correlate With Those in Helper T Cell Responses to Xenoantigens In Vitro.....371
Robert D. Moses, MD, Henry J. Winn, PhD, and Hugh Auchincloss, Jr., MD, FACS

Reversal of Acute Hepatic Failure in Pigs by Xenogeneic Hepatocyte (HC) Transplantation and by Injection of Supernatant from Xenogeneic HC Cultures.....374
Carlos G. Fasola, MD, Yu S. Kim, MD, J. Carlos Manivel, MD, Frank B. Cerra, MD, FACS, Arthur J. Matas, MD, FACS, and William D. Payne, MD, FACS

Xenograft Rejection in Immunodeficient Mice.....376
Wesley Marchman, MD, Dorian Araneda, RTE, Andrea Carobbi, MD, Judith M. Thomas, PhD, and Francis T. Thomas, MD

Prolongation of Rat to Mouse Islet Xenografts With Ultraviolet Irradiation and Antibodies to Murine CD2 or CD4 378
Henry T. Lau, MD, Jonathan Bromberg, MD, PhD, Kenneth Chavin, MD, Ali Naji, MD, James O'Neill, MD, Clyde Barker, MD, Peter Altevogt, PhD, Bruno Kyewski, PhD, and Briegitte Guckel, BS

Effect of RS-61443 in Preventing Rejection in Sensitized Recipients 380
Stuart J. Knechtle, MD, Jue Wang, MD, Melanie Beeskau, BS, William J. Burlingham, PhD, Hans W. Sollinger, MD, PhD, and Folkert O. Belzer, MD

Demonstration of Local Immunosuppression With Methylprednisolone and Cyclosporine in the Sponge Matrix Allograft Model 382
Chris E. Freise, MD Sue Clemmings, BS, L. Edward Clemens, PhD, Eric R. Ashby, MD, Todd J. Alan, BS, Tom C. Ashby, BS, David Chang, BS, John P. Roberts, MD, and Nancy L. Ascher, MD, PhD, FACS

Mixed Chimerism Can Be Adoptively Transferred to Secondary Recipients 385
Sherry M. Wren, MD, and Suzanne T. Ildstad, MD

Therapy With Anti-CD4 mAb Prevents Sensitization and Prolongs Cardiac Allograft Survival in Rats 387
Tomasz Sablinski, MD, PhD, Nicholas L. Tilney, MD, FACS, FRCS, Wayne W. Hancock, MD, PhD, Mohamed H. Sayegh, MD, Edgar L. Milford, MD, and Jerzy W. Kupiec-Weglinski, MD, PhD

Graft vs. Host Disease After Small Bowel Transplantation or Lymphocyte Transfer Is Associated With Tumor Necrosis Factor Alpha in the Serum 389
Jacques Pirenne, MD, Gerard Degiovanni, MD, Nathalie Franchimont, MD, Ghislaine Scheppens, MD, Tony Meager, MD, and David L. Dunn, MD, PhD

Effect of Passenger Cell Depletion on Allograft Survival 392
Matthias Gundlach, MD, Tarik Wasfie, MD, Vivette D'Agati, MD, Kris Englestad, BS, Soji Oluwole, MD, and Mark A. Hardy, MD

The Role of Iron in Rejection of Vascularized Organ Allografts 394
David Whitley, MD, Wayne W. Hancock, MD, PhD, Jerzy W. Kupiec-Weglinski, MD, PhD, and Nicholas L. Tilney, MD, FACS, FRCS

Rapid Detection of T Helper 2 Cells by Message Amplification Phenotyping 397
Stewart C. Wang, MD, David J. Tweardy, MD, Rosemary Hoffman, BA, Henri R. Ford, MD, and Richard L. Simmons, MD, FACS

Hepatitis-Related Risk Factors in Renal Transplant Recipients and Donors 400
Dinesh Ranjan, MD, John Fernandez, MD, Violet Esquenazi, PhD, Les Olson, Nancy Contreras, RN, George Burke III, MD, David Roth, MD, and Joshua Miller, MD

Effects of Lung Preservation ..... see addendum

Differential Cardiac and Pulmonary Rejection in the Rat: Evidence Suggesting a Tissue-Specific Phenomenon 402
Thomas Flavin, MD, Judith Shizuru, PhD, E. Grant Hoyt, Margaret Billingham, MB, BA, Karl Seydel, MS, C. Garrison Fathman, MD, and Vaughn A. Starnes, MD

Twenty-Four Hour Lung Preservation With Donor Core-Cooling and Leukocyte Depletion in a Bilateral Lung Transplant Model 405
Stephan Schueler, MD, Masataka Hatanaka, MD, Ko Bando, MD, Duke Cameron, MD, Robert Kay, Malcolm Brock, Patrick DeValeria, MD, Grover Hutchins, MD, Bruce Reitz, MD, and William Baumgartner, MD

The Effectiveness of UW Solution in 24-Hour Preservation of the Small Bowel: An Isolated Ex Vivo Perfusion Model.....408
Eliezer Katz, MD, Freya R. Schnabel, MD, and Bernard M. Jaffe, MD, FACS

Successful Treatment of Ongoing Intestinal Allograft Rejection Permits Recovery of Graft Structure and Function.....410
Kenneth K.W. Lee, MD, Jan M. Langrehr, MD, Manfred J. Stangl, MD, Michael Wachs, MD, and Wolfgang H. Schraut, MD, FACS

Inhibition of Kupffer Cell Activity With Latex Particle Pretreatment Results in Improvement in Hepatic Allograft Viability After Prolonged Periods of Cold Storage.....413
Howard N. Sankary, MD, Preston Foster, MD, Esther Brown, CVT, Richard Bone, MD, Larry C. Casey, MD, PhD, and James Williams, MD

Anti-Tac-Yttrium-90 Prolongs Cardiac Graft Survival in Primate Homograft Transplantation.....415
Frederick M. Dirbas, MD, Paul S. Brown, Jr., MD, Saed Mirzadeh, PhD, Patrick K. Griffith, MD, Carolyn K. Goldman, Roger J. Garsia, MD, Richard Junghans, MD, PhD, Otto A. Gansow, MD, Thomas A. Waldmann, MD, and Richard E. Clark, MD, FACS

Heterotopic Heart Transplantation in Partially Inbred Miniature Swine: The Influence of MHC Matching on Rejection of Cardiac Allografts.....417
Christopher D. Stone, MD, Bruce R. Rosengard, MD, Hani A. Hennein, MD, Eric Mendeloff, MD, David H. Sachs, MD, and Richard E. Clark, MD, FACS

Photochemotherapy Provides Donor-Specific Immunosuppression in Cardiac Transplantation 421
Juan A. Sanchez, MD, Niloo M. Edwards, MD, Carole L. Berger, PhD, Gary Y. Ott, MD, Lawrence Coppey, Xu He, MD, Jonathan C. Fong, MD, Keith Reemtsma, MD, and Eric A. Rose, MD

Mitochondrial Function After 24 Hours of Storage With the University of Wisconsin Solution 423
Kevin H. Teoh, MD, FRCSC, Ren-Ke Li, MD, Richard D. Weisel, MD, FRCSC, Stephen E. Fremes, MD, FRCSC, Donald A.G. Mickle, MD, FRCPC, and Laura C. Tumiati, BSc

The Effect of Bilateral Renal Denervation on Cyclosporine Nephrotoxicity 425
Freya R. Schnabel, MD, Richard B. Wait, MD, PhD, and Kim U. Kahng, MD

CHAPTER IX—Oncology

MHC Class I Antigen Restriction of Tumor Recognition by Lymphocytes Infiltrating Human Melanomas 428
Sophia S. Hom, MD, Suzanne L. Topalian, MD, and Steven A. Rosenberg, MD, PhD, FACS

T-Cell Cytotoxicity in Melanoma Patients Receiving Active Specific Immunotherapy (ASI) and Correlation to Clinical Outcome 430
Leland J. Foshag, MD, FACS, Dave S.B. Hoon, PhD, Edward Okun, BS, J. Anne Nizze, PAC, and Donald L. Morton, MD, FACS

Efficacy of Human Tumor-Specific Cytotoxic T Cells in the Treatment of Human Melanoma Hepatic Metastases in Nude Mice 432
Nancy J. Crowley, MD, Carol E. Vervaert, MT, and Hilliard F. Seigler, MD, FACS

Effects of Low Dose OKT3 Induction on the Anti-Tumor Immune Response in Cancer Patients Receiving Interleukin-2 (IL-2) and Tumor Necrosis Factor-Alpha (TNF).....434
Stephen C. Yang, MD, Elizabeth A. Grimm, PhD, and Jack A. Roth, MD, FACS

Differential Activity of Interferon-Alpha on the Function of Sensitized T Cells in Adoptive Immunotherapy.....436
Douglas L. Vander Woude, MD, Suyu Shu, PhD, and Alfred E. Chang, MD, FACS

Human Kupffer Cells Produce Cytotoxic Monokines.....438
Steven A. Curley, MD, Jim Klostergaard, PhD, and Mark S. Roh, MD

Interleukin-4: A Potent Inhibitor of IL-6, TNF-α, IFN-γ, and IL-1β Production.....441
Jeffrey D. Lee, MD, Stephen G. Swisher, MD, Elaine H. Minehart, MS, William H. McBride, PhD, Sidney H. Golub, PhD, and James S. Economou, MD, PhD, FACS

Induction of B16-F10 Murine Melanoma Differentiation by Tumor Infiltrating Lymphocyte Clone Culture Supernatants 445
Rene Lafreniere, MD, CM, FRCSC, FACS, Katzuo Maeda, MD, and L. Martin Jerry, MD, FRCPC, FACP

Isolation of New Markers for Presymptomatic Genetic Testing in Multiple Endocrine Neoplasia Type IIA.....447
James R. Howe, MD, Santosh K. Mishra, PhD, Jennifer A. Korte, BA, Samuel A. Wells, Jr., MD, FACS, and Helen Donis-Keller, PhD

Influence of Tumor Location on Cytokine Production and Host Metabolism.....450
Yuman Fong, MD, Lyle L. Moldawer, PhD, Wei He, MD, Michael Marano, MD, Christopher V. Keogh, BS, Jeffrey Gershenwald, MD, and Stephen F. Lowry, MD, FACS

Enhancement of Cisplatinum Cytotoxicity With Pulse and Continuous Treatment with Epidermal Growth Factor in a Human Pharyngeal Cancer Cell Line 452
Lawrence D. Wagman, MD, FACS, and Marianne Metz, BS

Metabolism of Normal Epithelial and Human Carcinoma Cells by ^{31}P-NMR Spectroscopy 454
Samuel Singer, MD, Lan Bo Chen, PhD,
Timothy J. Eberlein, MD, FACS, and Leo J. Neuringer, PhD

Increased Expression of Ribosomal Protein S6 in Human Colon Cancer 457
Raymond J. Staniunas, MD, Ken-ichi Mafune, MD, PhD,
Michael L. Lu, PhD, Lan Bo Chen, PhD, and
Glenn Steele, Jr., MD, PhD, FACS

Activation of the c-K-ras Gene in the Colon Adenoma-Carcinoma Sequence 459
G. Capellá, MD, F. Lluis, MD, J. Sancho, MD, and
M. Perucho, PhD

Prognostic Significance of Ras and C-myc Protein Expression in Young Patients With Colorectal Cancer 461
Felice Miller, MD, Thomas M. Heimann, MD, FACS,
Daniel J. Pyo, MD, Arnold Szporn, MD, Giorgio Martinelli, PhD,
Astrid Quish, MD, and Thomas M. Fasy, MD, PhD

Experimental Hepatic Metastases From Human Colorectal Cancers: Correlation With Sialyl Transferase Activity, Sialic Acid Content, and CEA Production 464
Peter Thomas, PhD, Hans E. Wagner, MD,
Brian E. Harvey, MD, PhD, Carol A. Toth, PhD,
Norman Zamcheck, MD, and Glenn D. Steele, Jr., MD, PhD, FACS

Prevalence of Chromosome 1p Deletions and Ras Gene Activation in Neuroblastomas, Pheochromocytomas, and Medullary Thyroid Cancers....466
Jeffrey F. Moley, MD, Michele B. Brother, BS, Samuel A. Wells, MD, FACS, and Garrett M. Brodeur, MD

Enhanced Hepatic Cytokine Gene Expression in Cachectic Tumor-Bearing Rats....469
J. Christian Jensen, MD, Carolyn M. Buresh, BS, Douglas L. Fraker, MD, Howard N. Langstein, MD, Gerard M. Doherty, MD, H. Richard Alexander, MD, and Jeffrey A. Norton, MD

Aspartate Aminotransferase mRNA Increases in Liver of Rats With Cancer Cachexia....473
Akira Okada, MD, Thanh H. Vu, PhD, Bard C. Cosman, MD, MPH, Lauri O. Byerley, PhD, RD, Andrew R. Hoffman, MD, and H. Fletcher Starnes, Jr., MD

Amplification of the erbB-2 Oncogene in Soft Tissue and Osseous Sarcomas....475
Rosemary B. Duda, MD, Deborah Cundiff, BS, Panithaya Chareonthaitawee, BS, and Carey Z. August, MD

Clinical Correlations of Chromosome Change in Human Primary Breast Cancer....477
I. Benjamin Paz, MD, Floyd H. Thompson, PhD, Jeffrey M. Trent, PhD, William S. Dalton, MD, and Hugo V. Villar, MD, FACS

Insulin-Like Growth Factor I Decreases Tumor Aneuploid Fraction and Preserves Host Lean Tissue Mass in a Rat Sarcoma Model....479
Eng-Hen Ng, MD, FRCS(Edin), Craig S. Rock, MD, Douglas Lazarus, PhD, Lisa Staiano-Coico, PhD, Lyle L. Moldawer, PhD, and Stephen F. Lowry, MD, FACS

The Effect of Preoperative Laser Hyperthermia and Laser Excision on Local Recurrence in Mammary Tumors 481
Raymond J. Lanzafame, MD, FACS, Mian-Jing Wang, DMD, John O. Naim, MS, and David W. Rogers, MS

Melanoma Phototherapy Is Enhanced by Glutathione Depletion 483
Louise Hom, MD, Benjamin F. Edwards, PhD, and Patrick L. Twomey, MD, FACS

CHAPTER X—Gynecology/Obstetrics

Evaluation of Peritoneal Closure at Cesarean Section Through a Vertical Skin Incision 487
Marcello Pietrantoni, MD, Michael T. Parsons, MD, Hector A. Arango, MD, William N. Spellacy, MD

CHAPTER XI—Neurological Surgery

Hydrocephalus Is Associated With Increased Venous Outflow Resistance in the Bridging Veins 493
Manuel E. Castro, MD, PhD, Harold D. Portnoy, MD, FACS, and John D. Maesaka, MD

Endothelin Inhibits Endothelium-Dependent Relaxation in Human Cerebral Arteries 495
Stephen M. Papadopoulos, MD, Kevin Schreur, BS, and R. Clinton Webb, PhD

Peripheral Vascular Response to Exercise-Induced and Postocclusive Reactive Hyperemia in Quadriplegics 498
Mark S. Nash, PhD, Cheryl M. Montefusco, PhD, and Barbara A. Rhodes, BS, RVT

Diaphragm Activation After Transcranial Magnetic Stimulation.....500
George H. Raque, MD, R. Dean Linden, PhD, Gregory E. Niznik, Christopher B. Shields, MD, FRCSC, Gregory B. Nazar, MD, and John R. Johnson, MD

Functional Enhancement of Intrastriatal Fetal Dopamine Cell Grafts by the Cotransplantation of Peripheral Nerve Tissue in a Rat Model of Parkinson's Disease 502
Wayne L. Wittenberg, MD, PhD, Craig G. van Horne, BA, Ingrid Stromberg, PhD, and Barry J. Hoffer, MD, PhD

Increasing the Life Span of Fibrin Sealant: A Comparison of Three Antifibrinolytic Agents 504
Thomas L. Matthew, MD, William D. Spotnitz, MD, FACS, Steven L. Gonias, MD, PhD, Robert D. Abbott, PhD, and John A. Jane, MD, PhD, FACS

Radiobiologic Models for Radiosurgery 506
Eric M. Altschuler, MD, and L. Dade Lunsford, MD, FACS

Cranial Nerve Preservation After Stereotactic Radiosurgery of Acoustic Neurinomas 508
Douglas Kondziolka, MD, L. Dade Lunsford, MD, FACS, Robert J. Coffey, MD, and John C. Flickinger, MD

Tamoxifen Inhibits Proliferation of Human Malignant Glioma Cells In Vitro 510
Ian F. Pollack, MD, Margaret S. Randall, MS, Matthew P. Kristofik, BS, Robert H. Kelly, PhD, Robert G. Selker, MD, and Frank T. Vertosick, Jr., MD

Dissection of Human Glioma Humoral Response Using Direct Serologic EBV-Proliferation, and Chimeric Mouse-Human Fusion Assays 513
Duncan K. Fischer, MD, PhD, Fatma Shaban, MS, Mohamed-Salah Abaza, Masafumi Matsuda, MD, Raj K. Narayan, MD, FACS, and M. Zouhair Atassi, PhD

Reduction in Peritumoral Brain Edema by an Intracranial Polymer Implant 516
Allen K. Sills, MD, Rafael J. Tamargo, MD, and Henry Brem, MD, FACS

CHAPTER XII—Orthopaedic Surgery

Xanthine Oxidase: Its Role in the No Reflow Phenomenon 519
David J. Smith, Jr., MD, FACS, Jeffrey D. Punch, MD, Edwin G. Wilkins, MD, Belinda Cashmer, MS, Gerd O. Till, MD, and Riley S. Rees, MD, FACS

The Effects of Prestretching on Skeletal Muscle Pulled to Failure.... 521
James D. Dalton, Jr., MD, Anthony V. Seaber, and William E. Garrett, Jr., MD, PhD

Preservation of Peripheral Nerve Grafts 522
Peter J. Evans, AB, MD, David C. Awerbuck, MD, Susan E. Mackinnon, MD, FRCSC, FACS, Alan R. Hudson, MB, FRCSC, and Nancy H. McKee, MD, FRCSC

The Effects of Betamethasone Following Stretch Injury to the Sciatic Nerve of the Rat 525
David A. Spiegel, MD, Anthony V. Seaber, and James R. Urbaniak, MD

Anterior Cervical Discectomy Using Holmium:YAG Laser 527
Jonathan D. Black, MD, Henry H. Sherk, MD, FACS, Anthony L.B. Rhodes, MD, and Richard C. Smith, MD

The Value of Skin Testing for Penicillin Allergy in Orthopaedic Surgery 531
William L. Hennrikus, MD, Thomas J. O'Brien, MD, Michael P. Muldoon, MD, and David B. Moyer, MD

Fracture Healing by Autologous Bone Marrow and Microcrystalline Hydroxyapatite 533
Todd A. Kile, MD, Basil S. Strates, MD, PhD, and John F. Connolly, MD, FACS

Timed Fixed-Dose Intraoperative Heparin Thromboembolic Prophylaxis in Primary Total Hip Arthroplasty.....537
Michael H. Huo, MD, Eduardo A. Salvati, MD, Nigel E. Sharrock, MBChB, George Go, BS, Robert Mineo, MS, and Thomas P. Sculco, MD

Significance of Osteotomy and Implant Characteristics in Per- and Subtrochanteric Osteotomies.....539
Wilhelm Friedl, MD

The Efficacy of Gallium Scintigraphy in Differentiating Benign From Malignant Soft Tissue Masses: A Prospective Study 543
Herbert S. Schwartz, MD

Chapter XIII—Otorhinolaryngology

Loss of Sensitivity to Inhibition by Transforming Growth Factor β in Squamous Cell Carcinoma Cells 545
Shawn C. Jones, MD, Gregory S. Schultz, PhD, and Serge A. Martinez, MD, FACS

Recurrences of Squamous Cell Carcinoma of the Head and Neck Past 24 Months.....546
Kevin L. Ziffra, MD, James M. Chow, MD, and Edward L. Applebaum, MD

Effect of Recurrent Laryngeal Nerve on Vocal Fold Functions: An In Vivo Canine Model 548
David H. Slavit, MD, and Thomas V. McCaffrey, MD, PhD, FACS

Progress Toward a Totally Implantable Laryngeal Pacemaker for Patients With Bilateral Paralysis.....550
Garrett D. Herzon, MD, Maisie L. Shindo, MD, David L. Zealear, PhD, and David G. Hanson, MD, FACS

Early Role for Neutrophils in Skin Flap Failure.....553
Kenneth W. Shaheen, MD, Jeffrey D. Punch, MD, Riley S. Rees, MD, FACS, Karen S. Guice, MD, FACS, Belinda A. Cashmer, MS, and David J. Smith, Jr., MD, FACS

Temporal Relationships for Secondary Ischemia.....555
Michael J. Biavati, MD, Michael F. Angel, MD, Kenneth R. Knight, PhD, Cary G. Mellow, FRACS, Robert Cantrell, MD, FACS, and Raymond F. Morgan, MD, FACS

The Use of a New Perfusate in Experimental Microvascular Flaps: A Threefold Increase in Ischemic Tolerance 557
Jon B. Turk, MD, Wen X. Zhang, MD, Michel Babajanian, MD, Mark L. Urken, MD, Hugh F. Biller, MD, and Hubert Weinberg, MD

Biochemical Changes in Previously Elevated Free Skin Flaps in Rodents 560
Cary G. Mellow, MD, FRACS, Michael F. Angel, MD, Kenneth R. Knight, PhD, Raymond F. Morgan, MD, FACS, and Bernard McC. O'Brien, CMG, MD, FRACS

Chapter XIV—Pediatric Surgery

Fully Xenogeneic Bone Marrow Transplantation Results in Stable Chimerism (Rat → Mouse) Across a Species Barrier.....562
Suzanne T. Ildstad, MD, Sherry M. Wren, MD, Mary L. Hronakes, BS, and Marcel Van Den Brink, MD

Early Patency and Cell Retention of Small Diameter Vascular Grafts Seeded With Genetically Engineered Endothelial Cells.....564
Kurt Newman, MD, FACS, James Zwiebel, MD, David Dichek, MD, Scott Freeman, MD, Kathryn Anderson, MD, FACS, and W. French Anderson, MD

T-Cell Mediated Inhibition of Smooth Muscle Hyperplasia in Venous Interposition Grafts.....566
Nicholas C. Saenz, MD, and Judah Folkman, MD, FACS

Growth of Fetal Renal Transplants Is MHC Dependent 570
E. Stanton Adkins, MD, Connie Streifinger, MD, and Robert P. Foglia, MD, FACS

Fetal Rabbit Intestinal Function After In Utero Esophageal Ligation 572
J. Duncan Phillips, MD, Eric Toloza, BS, Robert E. Kelly, Jr., MD, Jared M. Diamond, PhD, and Eric W. Fonkalsrud, MD, FACS

Retrograde ECMO Perfusion of Isolated Piglet Lungs to Locate the Sensor/Effector of Hypoxic Vasoconstriction.....574
Mark E. Galantowicz, MD, Mitchell Price, MD, and Charles J.H. Stolar, MD

Preoperative ECMO Improves Respiratory System Compliance in Newborns With Congenital Diaphragmatic Hernia 576
Don K. Nakayama, MD, Etsuro K. Motoyama, MD, Samuel D. Smith, MD, and Edward M. Tagge, MD

P53 Expression in Neuroblastoma.....579
Andrew M. Davidoff, MD, Jeffrey C. Pence, MD, Billie-Jo M. Kerns, MT, J. Dirk Iglehart, MD, FACS, Nicholas A. Shorter, MD, and Jeffrey R. Marks, PhD

Evaluation of High-Intensity Focused Ultrasound in the Treatment of Murine Neuroblastoma 581
Frederick J. Rescorla, MD, Rong Yang, MD, Clarence R. Reilly, MS, Narendra T. Sanghvi, MS, Francis J. Fry, MS, Thomas D. Franklin, PhD, Lawrence Lumeng, MD, and Jay L. Grosfeld, MD, FACS

Are Alterations in Fetal Small Intestine Mucosa After Epidermal Growth Factor Exposure Dose Dependent? 583
John H. Melone, MD, George C. Charpied, MS, and Marshall Z. Schwartz, MD, FACS

Hemorheologic Effects of Endotoxin in the Neonate 586
Nicholas D. Poulos, MD, and Daniel L. Mollitt, MD, FACS

Critical Mass of Replanted Splenic Tissue Needed to Restore Specific Antibody Response to Pneumococcal Polysaccharide After Splenectomy 588
Jane T. Kugaczewski, MD, Wolfgang Pimpl, MD, Debbie Youngelman, MD, Chun-Kuo Chen, MD, Peter K. Kottmeier, MD, FACS, Gerald Schiffman, PhD, and Francisca A. Tolete-Velcek, MD, FACS

Chapter XV—Plastic Surgery

Experimental Reconstruction of Tracheal Defects Using Prefabricated Jejunal Free Tissue Transfer 591
John H. Barker, MD, PhD, Jin-Mei Gu, MD, Joseph C. Banis, MD, and Gary L. Anderson, PhD

Custom Fabrication of Vascularized Bone Grafts Using Osteoinductive Transforming Factors 593
David M. Brown, MD, and Roger K. Khouri, MD

Chitosan Interface Improves Stability of Vascularized Chitin Composite Construct 595
Robert L. Walton, MD, FACS, Kathleen A. Wortham, BA, and Li Zhang, DDS

A Study of Orbital Anatomy and Volume for the Correction of Enophthalmos 597
Warren Schubert, MD, Naomi Quillopa, RN, and Alan R. Shons, MD, PhD, FACS

Quantification of Epidermal Growth Factor Receptor Levels in Diabetic Foot Ulcer Margins 600
Gareth D. Griffiths, MB, ChB, FRCS, Fred J. Hendler, MD, PhD, Catherine Pietsch, BS, and T. Jeffery Wieman, MD, FACS

Correction of Diabetic Incisional Healing Impairment With Basic Fibroblast Growth Factor 602
Linda G. Phillips, MD, FACS, Peter Geldner, MD, Juan Brou, MD, Stewart Dobbins, James Hokanson, PhD, and Martin C. Robson, MD, FACS

Should Dying Flaps Be Converted to Skin Grafts? 603
Riley S. Rees, MD, FACS, Jeffrey D. Punch, MD, Belinda A. Cashmer, MS, Edwin G. Wilkins, MD, and David J. Smith, Jr., MD, FACS

Chloroquine Inhibits Silicone Implant Capsule Formation 605
Timothy R. Brown, MD, John H. Emerson, Jr., MD, Marie Nadine St. Arnault, MD, Miles C. Tommeraasen, MD, Robert L. Abbott, John Terry, MD, FACS, and LeRoy H. Stahlgren, MD, FACS

Effects of Ultraviolet-A Pretreatment on Wound Healing and Implant Capsule Formation 608
Gurhan Ozcan, MD, Saleh Shenaq, MD, FACS, Hassan Chahadeh, MD, and Melvin Spira, MD, DDS, FACS

Wound Tensile Strength After Ultraviolet Irradiation in the Hairless Guinea Pig 611
Shelby K. Brantley, Jr., MD, and
Suman K. Das, MD, FACS, FRCS, FRCS(Ed)

Prolonged Tissue Expansion Inhibits Fibroblast Contraction..... 614
Benjamin Chang, MD, Robert E. Tuchler, MD,
John W. Siebert, MD, and D. Andrew R. Burd, MD

Electrically Induced Modulation of Collagen Synthesis in Cultured Human Fibroblasts 617
Robert J. Goldman, MD, MS, Robert L. McCauley, MD,
David R. Ritchie, PhD, Stuart G. Abrams, PhD,
Martin C. Robson, MD, FACS, and David N. Herndon, MD, FACS

Electrically Charged Particles: A New Method to Promote Healing.. 619
Thomas A. Mustoe, MD, FACS, Dean A. Weber, MD, and
Marilyn Krukowski, PhD

Granulocyte-Macrophage Colony Stimulating Factor in Open Wound Healing..... 621
Peter G. Hayward, MBBS, FRACS, Peter Geldner, MD,
Bruce Altrock, PhD, Glenn Pierce, MD, PhD, and
Martin C. Robson, MD, FACS

Incisional Wound-Healing in a Fluid Environment 623
Paul Y. Liu, MD, Karl H. Breuing, MD, Elof Eriksson, MD, FACS,
and Don R. Miller, PhD

Growth Factors Are Present in Human Wound Fluid..... 627
D. Scott Rotatori, MD, H. Hollis Caffee, MD, FACS,
Edward M. Copeland, MD, FACS, and Gregory S. Schultz, PhD

Acceleration of Tissue Repair by Transforming Growth Factor-β: In Vivo Mechanism of Action by Selective Radiotherapy Impaired Healing..... 630
Douglas T. Cromack, MD, James A. Purdy, PhD,
Beatriz Porras-Reyes, MD, and Thomas A. Mostoe, MD, FACS

Chitosan Reduces Inflammation and Fibrosis in Subcutaneous Implants in Rat Wounds 632
James D. Dunn, MD, Robert F. Diegelmann, PhD, Danna E. Johnson, MD, Beatrice B. Abrams, PhD, and I. Kelman Cohen, MD, FACS

Induction of Neovascularization by Type I Collagen 634
McKay McKinnon, MD

Hyaluronic Acid Patterns in Fetal and Adult Wound Fluid 636
Ernest S. Chiu, BS, Michael T, Longaker, MD, N. Scott Adzick, MD, Michael Stern, DMD, Michael R. Harrison, MD, FACS, and Robert Stern, MD

Adult Skin in the Fetal Environment Heals With Scar Formation 639
Michael T. Longaker, MD, David J. Whitby, MD, Russell W. Jennings, MD, Brian W. Duncan, MD, Timothy M. Crombleholme, MD, Michael R. Harrison, MD, FACS, Mark W.J. Ferguson, DMD, and N. Scott Adzick, MD

Platelet-Derived Growth Factor Induces Fibrosis at a Fetal Wound Site 641
Jeffrey H. Haynes, MD, Danna E. Johnson, MD, Louise C. Flood, MScAgr, Bruce A. Mast, MD, Teresa A. Habacker, MD, Robert F. Diegelmann, PhD, I. Kelman Cohen, MD, FACS, and Thomas M. Krummel, MD, FACS

An Ex Utero Model of Fetal Wound Healing 643
Jeffrey A. Ditesheim, MD, M. Stephen Ledbetter, BS, Michael J. Morykwas, PhD, Wesley D. Vander Ark, BS, Debby A. Jennings, BS, and Louis C. Argenta, MD, FACS

Tumor Recurrence in Previously Irradiated Tissue: An Animal Model 646
Ellen P. Morgan, AB, John A. Persing, MD, Donald G. Baker, PhD, William Constable, MD, and Michael Angel, MD

A Comparative Study of Autologous Fat Injections 974XZ Harvested by Different Techniques 648
David Bowen, BS, Saleh M. Shenaq, MD, Roya Maani, MD, and Melvin Spira, MD

The Influence of Dural and Periosteal Age on Cranial Bone Regeneration in the Immature Animal 650
P. Craig Hobar, MD, Jonathan S. Schreiber, MD, Joseph G. McCarthy, MD, and Patricia A. Thomas, MD

Demineralized Bone Matrix/Polydiaxanone Composite as a Substitute for Bone Grafting 653
Mohamadreza Yazdi, DDS, Larry S. Nichter, MD, R. Sredjaja, G.M. Sloan, MD, J.F. Reinisch, MD, Kambiz Kosari, and Marcel E. Nimni, PhD

Alternatives in Craniofacial Reconstruction: The Use of Frozen Membranous Allografts in Rabbits 657
Steven R. Buchman, MD, Isaac L. Wornom III, MD, Linton A. Whitaker, MD, and Scott P. Bartlett, MD

Biochemical Effects of Hyperbaric Oxygen on the Storage of Amputated Limbs in Rats 659
Richard J. Edwards, MD, Michael J. Im, PhD, and John E. Hoopes, MD, FACS

The Prevention of Muscle Atrophy After Peripheral Motor Nerve Repair With an Implantable Electrical System 661
Daniel L. Durand, MD, and H. Bruce Williams, MD, FACS, FRCSC

Study of the Microcirculation in the Isolated Perfused Human Skin Flap Model 664
Michael L. Kreidstein, MD, Steven L. Zacks, and Cho Y. Pang, PhD

Microcirculatory Analysis of Acute and Delayed Skin Flaps of the Hairless Mouse Using In Vivo Microscopy.....667
Jerry A. Rubin, MD, Thomas J. Galla, MD, and Konrad Messmer, MD

The Effect of Subcutaneous Adipose Tissue on Skin Flap Survival in Rats 670
Lesley Wong, MD, Michael J. Im, PhD, and John E. Hoopes, MD, FACS

Evidence for Xanthine Oxidase Activity in Human Free Flaps After Reperfusion 672
E.G. Wilkins, MD, J.D. Punch, MD, R.S. Rees, MD, B. Cashmer, MS, G.O. Till, MD, and D.J. Smith, MD

The Fate and Distribution of ^{13}C-Labelled Phosphocreatine Studied in Experimental Skin Flaps With High Resolution ^{13}C NMR Spectroscopy 675
Ada Cheung, BS, Charles B. Cuono, MD, PhD, FACS, and Ian M. Armitage, PhD

Chapter XVI—Reproductive Biology

Correction of Surgically Induced Erectile Dysfunction in the Rat by Microsurgical Interposition Nerve Graft Repair of the Cavernosal Nerves.....678
Robert A. Ball, MD, Jerome P. Richie, MD, FACS, and Martyn A. Vickers, MD, FACS

Preservation of Fertility After Doxorubicin Administration.....680
Gregory J. Liebscher, MD, Christine G. Janney, MD, Marie C. LaRegina, DVM, Kym C. Tolman, BS, and Frank E. Johnson, MD, FACS

Standardization of Fine Needle Aspiration Biopsy of Human Testes Using DNA Flow Cytometry 682
Jeffrey C. Lapeyrolerie, MD, Joan E. Avent, BS, James S. Malter, MD, and Wayne J. Hellstrom, MD

Pressure/Volume Relationships in a Computerized Diabetic Rat Cystometry Model 685
John A. Belis, MD, FACS, Robert M. Curley, BS, Steven J. Winter, BS, and Thomas J. Rohner, Jr., MD, FACS

Androgen Receptor Staining in Heterogeneous Samples of Normal, Hyperplastic, and Neoplastic Human Prostate 687
David M. Kranc, MD, PhD, Gerald W. Chodak, MD, and Chawnshang Chang, PhD

Molecular Ras Gene Analysis of Human Prostate Tissues Using the Polymerase Chain Reaction 689
Uday R. Poonamallee, MD, Paul H. Gumerlock, PhD, Frederick J. Meyers, MD, Ernest S. Kawasaki, PhD, and Ralph W. deVere White, MD

Chapter XVII—Urology

Neoplastic Transformation of Normal Mouse Urothelium by Sequential Introduction of Complementing Oncogenes 692
Hans E. Wagner, MD, Glenn D. Steele, Jr., MD, PhD, FACS, and Ian C. Summerhayes, PhD

Abrogation of Invasion by Human Bladder Tumor Cells Using Protease Inhibitors 694
S. Mark Redwood, MD, Robert E. Weiss, MD, Michael J. Droller, MD, FACS, and Brian C.S. Liu, PhD

Preclinical In Vivo Assessment of 5-Fluorouracil/Cisplatin With and Without Dipyridamole Against a Human Bladder Tumor Line: Correlation of Tumor Growth Inhibition With Host Survival.....696
Thomas E. Keane, MB, FRCSI, Jeffrey R. Gingrich, MD, Gary Rosner, ScD, and Philip J. Walther, MD, PhD, FACS

Adverse Effect of Fibrin Clot Inhibitors on Intravesical BCG Therapy for Superficial Bladder Tumors.....698
M'Liss A. Hudson, MD, William J. Catalona, MD, and Timothy L. Ratliff, PhD

Altered Collagen Physiology in Invasive Bladder Cancer Cell Lines.....700
Richard N. Schlussel, MD, Michael J. Droller, MD, FACS, and Brian C.-S. Liu, MD, PhD

Developmental Factors in the Contractile Response to Bethanechol: Role of Calcium Translocation.....703
Robert M. Levin, PhD, Stephen A. Zderic, MD, Keith Van Arsdalen, MD, John W. Duckett, MD, and Alan J. Wein, MD

A Tumor Cell Growth Inhibitor Found in Benign Prostate Tissue....705
Mark S. Litwin, MD, Marcela Chackal-Roy, MS, Jerome P. Richie, MD, and Bruce R. Zetter, PhD

Metabolic Characterization of Human Prostatic Adenocarcinoma by Multinuclear (^{1}H,^{31}P) Magnetic Resonance Spectroscopy 708
Perinchery Narayan, MD, FACS, John Kurhanewicz, PhD, Prahalad Jajodia, MD, and Thomas L. James, PhD

Production and Regulation of Interleukin-6 by Renal Cell Carcinoma In Vitro: Protein Activity and mRNA Gene Expression.....710
Alec S. Koo, MD, Bernard Bochner, MD, Jean B. deKernion, MD, FACS, and Arie Belldegrun, MD

Pharmacologically Induced Increased Plasma Prostacyclin to Thromboxane Ratio Protects Testis From Ischemic Necrosis: Preliminary Results 713
Ronald P. Kaufman, Jr., MD, Thomas E. Keane, MB, FRCSI, J. Allan Tucker, MD, Herbert B. Hechtman, MD, FACS, and Phillip J. Walther, MD, PhD, FACS

Molecular Changes in the Contralateral Kidney After Unilateral Renal Ischemia: Evidence of Acute Injury 715
John P. Connor, MB, BCh, Ralph Buttyan, PhD, Carl A. Olsson, MD, and Ihor S. Sawczuk, MD

Renal Decapsulation Improves Postischemic Renal Function in the Rat 717
John F. Beauregard, MD, Diana S. Malcolm, PhD, Norman E. McSwain, Jr., MD, FACS, and William P. Wiesmann, MD

Addendum to Chapter VIII

Effects of Lung Preservation Solution on Differential Lung Function and Pulmonary Hemodynamics in an Acute Canine Model 719
Philip C. Corcoran, MD, Yining Wang, MD, James D. St. Louis, BS, Marie L. Foegh, MD, Peter W. Ramwell, PhD, Sunder S. Rajan, PhD, Ali R. Analouei, PhD, Robert B. Wallace, MD, FACS, and Nevin M. Katz, MD, FACS